U23 Publication of Utility Model Application H02-48117

Title of the Device : The Air cleaner which has the honeycomb-type element
Application ; S63-128210 Sept.30,1988
Creator of Device : Yoshio Ishii, Shoukichi Niijima
Applicant : Tsuchiya Seisakusho Ltd.

Specification

1. Title of the Device : The Air cleaner which has the honeycomb-type element

2. Claim of Utility Model

The air cleaner has the honeycomb-type element which is firmly fixed in the cylindrical part in the case.

The case has the inlet & outlet pipes, the conical parts which are between the inlet & outlet pipes and the cylindrical part, and the cylindrical part.

The length between the end of the honeycomb-type element and the conical part is 0.125 times as long as the diameter of the cylindrical part.

3. Detailed Explanation of the Device

(Industrial Applicability)

For example, the device is related to the air cleaner with the honeycomb-type element and it is used for the inlet system of internal combustion engines.

(Prior Art)

The structure of the honeycomb-type element 4 shown in Fig.2 is as follows.

The wave plate media 2 is piled on the flat plate media 1 . The wave plate media 2 has the hills and the dales. One side of the hills and the other side of the dales are sealed. Such combined media is rolled up around the center core 3 ,and the end of the combined media is fixed on the outside of the coil. The honeycomb-type element 4 is placed in the air cleaner case with the inlet & outlet pipe.

The traditional air cleaner shown in Fig.3 has the honeycomb-type element 4 in the case 7 with inlet pipe 5 and outlet pipe 6. There are

the conical parts 8 between the case 7 and the inlet & outlet pipes 5 ,6 .
The air comes in from the inlet pipe 5 of the case 7 , passes through the honeycomb-type element 4 and flows out to the outlet pipe 6 .
The air is filtrated during the process mentioned above.

(Problem to be Solved by the Device)

The air cleaner shown in Fig.3 has the conical parts which are connected to the cylindrical part directly at the position corresponding to the end of the honeycomb-type element, and this structure makes the air-flow resistance increase.

That is, the air which comes in from the inlet pipe 5 becomes turbulent while going through the conical part 8 , and reaches the face of the honeycomb-type element in its turbulent state.

(Means for Solving Problem)

The honeycomb-type element is fixed firmly in the cylindrical part between the conical parts which are connected to the inlet & outlet pipe.

And, the length between the ends of the honeycomb-type element and the ends of the conical parts is 0.125 times as long as the diameter of the cylindrical part or over.

(Operation)

The air which comes in from the inlet pipe becomes turbulent in the conical part, but the air flow is straightened in the cylindrical part in front of the honeycomb-type element before it reaches the face of the inlet side of the honeycomb-type element.

(Working Example)

The air cleaner shown in Fig.1 is related to the device, and has the honeycomb-type element 11 in the case 10 . The honeycomb-type element 11 is the same as the traditional one.

The wave plate media 14 is piled on the flat plate media 13 ,and the combined media is rolled up around the center core 12 .

The end of the combined media is fixed on the outside of the coil.

The hills of the wave plate media 14 are closed at one side and the

dales of the wave plate media 14 are closed at the other side.

In this way, many fluted channels which are opened at one side and closed at the other side are formed between both ends. (Fig. 2)

The case 10 consists of the inlet pipe 16 ,the outlet pipe 17 ,the cylindrical part 18 and the conical parts 19 which are connected to both sides of the cylindrical part 18 . The buffer material 20 is inserted between the honeycomb-type element 11 and the cylindrical part 18 ,and the honeycomb-type element 11 is firmly fixed in the cylindrical part 18 . The length of the cylindrical part 18 in the case 10 is longer than the length of the honeycomb-type element 11 .

The dimension of the case 10 is as follows.

The diameter of the inlet & outlet pipes 16, 17 is 90 mm ,and the diameter of the cylindrical part 18 is 170 mm .

The conical parts 19 slope 30 deg. inward from the imaginary extensions of cylinder part 18 . The length (A) between the conical parts 18 and the honeycomb-type element 11 is 25.5 mm each other.

In this device, the length is set to a value that is equal to or greater than the diameter of the cylindrical part x 0.125 .

The air comes in from the inlet pipe 16 , passes through the inside of the honeycomb-type element 11 and flows out to the outlet pipe 17 .

The air is filtrated during the process mentioned above.

The reason why the length (A) between the face of the honeycomb-type element and the conical part is set to a value that is equal to or greater than the diameter of the cylindrical part x 0.125 is as follows.

That is, Fig.4 is the diagram which shows the relationship between the length (A) and the air-flow resistance (delta P). The length (A) is the distance between the end face of the honeycomb-type element 11 and the conical parts 19 .

In Fig.4 ,the scale (a) of the horizontal axis means the value of (A) divided by (D).

As can be clearly understood in Fig.4 , the air-flow resistance (delta P) is almost constant when the length (A) is 0.125 x (D) or over.

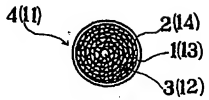
(Effect of the Invention)

As mentioned above, in this device, when the length between the end of the honeycomb-type element and the conical part is 0.125 times as long as the diameter of the cylindrical part or over, the air-flow resistance reaches and remains its lower limit.

4. Brief Description of Drawing

Fig.1 is the sectional view of the working example in this device.
Fig.2 is the plane view of the honeycomb-type element.
Fig.3 is the sectional view of the traditional filter.
Fig.4 is the test diagram which shows the effect of this device.

10 : case
11 : honeycomb-type element
16 : inlet pipe
17 : outlet pipe
18 : cylindrical part
19 : conical part



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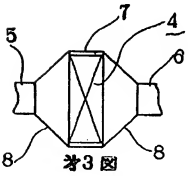

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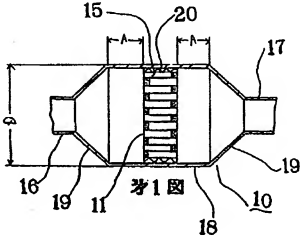

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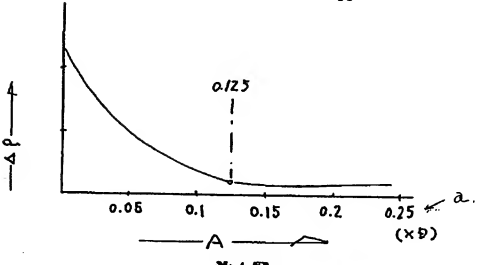

第4図

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3. Detailed Explanation of the Device

(Industrial Applicability)

For example, the device is related to the air cleaner with the honeycomb-type element and it is used for the inlet system of internal combustion engines.

(Prior Art)

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the conical parts 8 between the case 7 and the inlet & outlet pipes 5 ,6 .
The air comes in from the inlet pipe 5 of the case 7 , passes through the honeycomb-type element 4 and flows out to the outlet pipe 6 .
The air is filtrated during the process mentioned above.

(Problem to be Solved by the Device)

The air cleaner shown in Fig.3 has the conical parts which are connected to the cylindrical part directly at the position corresponding to the end of the honeycomb-type element, and this structure makes the air-flow resistance increase.

That is, the air which comes in from the inlet pipe 5 becomes turbulent while going through the conical part 8 , and reaches the face of the honeycomb-type element in its turbulent state.

(Means for Solving Problem)

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The air is filtrated during the process mentioned above.

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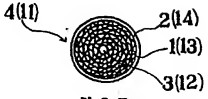
16 : inlet pipe

17 : outlet pipe

18 : cylindrical part

19 : conical part



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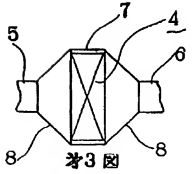

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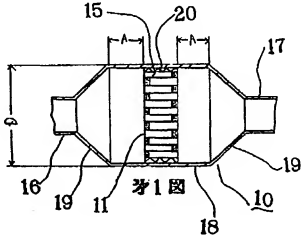

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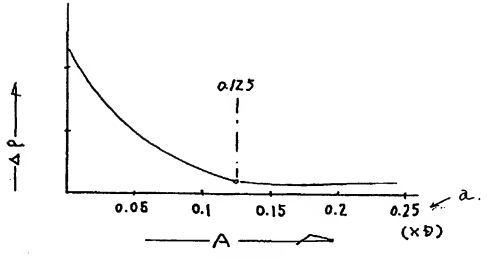

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